

# Societal Impact $10^{-9}$

## From Lab to Society: Developing an Informed Approach to Nanoscale Technology

University of South Carolina NIRT

### Between Nano-Visionary and Nano-Skeptic

Nanoscale science and engineering presents new challenges and opportunities not only to the scientific research community but also to all those who shape its public understanding.

As nanoscale researchers claim a middle ground between nano-visionaries and nano-skeptics, the public also seeks a middle ground between overreaching "hype" and irrational fear.

### Objectives: Dialogue, Research, Understanding

Our interdisciplinary research team is establishing a variety of opportunities to bring about a broadly inclusive dialogue on nanoscale science and technology. Within this model, we pursue a collection of four research projects each aimed at establishing an informed understanding of nanoscale science and technology.

### Co-evolution: Public Understanding with Science and Technology

Literary and artistic speculation has typically run ahead of scientific developments, while philosophical interpretation has lagged behind, awaiting theoretically mature science. Also, while popular perception has been influenced by the rhetoric of promise and fear, the quantitative science of risk assessment has brought its specialized tools only to specific and well-understood technologies. In contrast, our project advances a public understanding that co-evolves with the emerging field of nanoscale science and technology.

### Joining the Bench Scientists

By establishing an integrated and participatory model we facilitate public understanding of nanoscale science and technology. As USC's NanoCenter investigators explore the properties of the nanoscale, a larger academic and non-academic public participates in their discussions. Through workshops, colloquia, conferences, publications, courses, etc., our interdisciplinary research team joins in dialogue bench scientists, humanities and legal scholars, students, and citizens.

### Four Research Task Areas

Four major interdisciplinary research projects explore the interface between science and society:

#### Task Area 1

Ideas of Stability and Control in the Theory and Practice of Nanoscale Research

#### Task Area 2

Imaging and Imagining the Nanoscale: From Atomic Force Microscopic Topographies to Science Fiction Utopias and Dystopias

#### Task Area 3

Problems of Self-replication, Risk, and Cascading Effects in Nanotechnology: Analogies between Biological Systems and Nanoengineering

#### Task Area 4

Moving Nanotechnology into the Public Sphere

### Accomplishments

NSF NIRT Award

AY2002/03

Workshop  
"Reading NanoScience"  
5-9 August 2002

International Conference  
"Discovering the Nanoscale"  
20-23 March 2003

NanoCulture Colloquium  
Series 9 presentations during  
AY2002/03

13 External Lectures by NIRT members

International email Discussion List  
[nanotalk@listserv.sc.edu](mailto:nanotalk@listserv.sc.edu)

#### Project website

with detailed project description, searchable database of abstracts,  
working papers, event calendar, link collection, etc.  
<http://www.cla.sc.edu/cpecs/nirt/>

### Educational Outreach

IGERT: Discovery at the Nanoscale—  
Synthesis, Characterization, Computation and Societal Implications  
(Preproposal Approved for Full Proposal Preparation and Submission)

Curricular Innovations:  
"Fundamentals of Inquiry in the Sciences" (spring 2003)  
"Human Enhancement" (fall 2003)  
"Biological Machines" (spring 2005)

Nano Semester (spring 2005 with USC Honors College)  
including courses on  
Philosophy at the Nanoscale: Creating a New Reality  
Post-humanism and Nanotechnology  
Chemistry and Nanotechnology  
Biological Machines  
Ultramicroscopy

REU in Nanoscience  
(summer 2002 & 2003)

Ten-week course combines training in scientific research  
and discussions of the ethics of scientific inquiry

Textbook *Understanding Nanotechnology*  
provides selected primary readings with substantial introductory essays on  
Nano Fundamentals, Nano Science, Nano Fiction, Nano Politics, Nano Politics

### Participants

Dept of Art  
Chris Robinson

Center for Bioethics  
George Khushf

Dept of Biological Sciences  
Loren Kapp

Dept of Chemistry  
Catherine Murphy

Dept of Civil Engineering  
Richard Ray

Dept of English  
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### Acknowledgments

Support: National Science Foundation

USC NanoCenter

USC College of Liberal Arts

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